DRAFT

PROCESS AREAS WORK PLAN

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INTRODUCTION

Atlantic Richfield Company has prepared this Draft Process Areas Work Plan (Work Plan) for various mine units located in and around the former Mill and Precipitation Plant area within the Yerington Mine Site. This Work Plan describes site investigation activities to be conducted pursuant to the Closure Scope of Work (SOW). The SOW (Brown and Caldwell, 2002) states: "soils in the mill/process and precipitation plant areas will be characterized with respect to their potential to pose a risk to human health or the environment. These areas include on-site process buildings, ditches, tanks and vats. Generally, soils will be analyzed for whole rock chemical analyses. The soils characterization program will be used to support the final closure plan for the process areas" and to evaluate potential impacts to groundwater.

Soil sample collection, materials characterization and analytical activities described in this Work Plan will support the development and evaluation of closure alternatives for process components, to be presented in a comprehensive Final Permanent Closure Plan (FPCP) for the mine site. The FPCP will identify buildings or equipment fixtures that will be subject to demolition, cover and/or removal and disposal of debris. Beneficiation units that contain materials, or significant material residues, will be evaluated as to their potential to pose a risk to human health.

The remainder of Section 1.0 of this Work Plan describes the location and hydrologic setting of the Process Areas, previous monitoring and sampling activities, and Data Quality Objectives. Section 2.0 presents information about the construction and operational history of the Process Areas, and a description of modifications over time based on an interpretation of aerial photography and topographic maps. Section 3.0 of this Work Plan presents proposed sampling locations, sampling protocols, and analyses for soils. Section 3.0 also presents a task-specific Job Safety Analysis in the context of the more comprehensive Health and Safety Plan developed for the Yerington Mine Site. Section 4.0 lists references cited in this Work Plan.

1.1 Location and Operational History

The Yerington Mine Site is located approximately one mile west of the town of Yerington in Lyon County, Nevada (Figure 1). The area of process components addressed in this Work Plan is located in the central portion of the mine site, as shown in Figure 2.

The Anaconda Mining Company, predecessor of the Atlantic Richfield Company, began mining operations in the early 1950s. From 1953 to 1965, operations at the site consisted of mining the Yerington Pit for copper oxide ores. The copper oxide ores were processed using a Vat Leach extraction process. The Vat Leach process involved crushing of graded, pit-mined oxide copper ore to a uniform, minus 0.5-inch size. The crushed ore was loaded into one of a row of eight large concrete leach vats where a weak sulfuric acid solution was used to produce a pregnant leach solution. This solution was passed on to precipitation cells located nearby, where copper was precipitated onto scrap iron and de-tinned cans. The barren solution then passed to iron launders where excess iron was removed, then re-acidized before re-circulating in the Leach Vats. Tailings were deposited as solids in the Oxide Tailings Area. The copper concentrate was sent off site for smelting.

In 1965, the mill and concentrator were built to allow processing of both oxide and sulfide ores. The sulfide ore process circuit involved fine crushing and copper sulfide recovery by chemical flotation, in which lime was added to the process solution to maintain a basic pH. Sulfide tailings were conveyed as a slurry to the Sulfide Tailings Area. A copper concentrate was produced from the sulfide ore, and was also shipped off site for smelting.

In 1989, Arimetco International initiated leaching operations at the mine site, with little disturbance in the Process Areas. The Arimetco Electrowinning Plant and associated process components are covered by a companion Work Plan, and are located south of the Process Areas (Figure 2). The Process Areas that are described in this Work Plan cover an area approximately 5,000 feet long and 2,000 feet wide, or about 230 acres.

1.2 Hydrologic Setting

The principal source of water in the Yerington area of Mason Valley is from the Walker River (Huxel, 1969). The East and West Walker Rivers originate in the Sierra Nevada and merge south of the mine site, from where the Walker River flows northward through the valley to Walker Gap. From Walker Gap, it turns eastward and then southeastward to Weber Reservoir and ultimately to its terminus at Walker Lake. The Walker River is the primary source of natural recharge to the alluvial ground water flow system that underlies the mine site, given that recharge from precipitation is very low (the annual average precipitation rate in the area is 5.46 inches per year; Huxel, 1969).

In general, the subsurface below the mine site consists of unconsolidated alluvial deposits derived by erosion of the uplifted mountain block of the Singatse Range and alluvial materials deposited by the Walker River. These unconsolidated deposits, collectively called the valley-fill deposits by Huxel (1969), comprise four geologic units: younger alluvium (including the lacustrine deposits of Lake Lahontan), younger fan deposits, older alluvium and older fan deposits. Lake Lahontan lacustrine deposits appear to have been removed and reworked by the Walker River as it meandered back and forth across the valley Huxel (1969). Huxel estimated that Pleistocene Lake Lahontan in Mason Valley persisted for a relatively short time and was less than 60 feet deep. Groundwater conditions at the Yerington Mine Site are the subject of a companion Work Plan.

1.3 Previous Investigations and Monitoring

Soil samples have not been collected for analysis as part of site investigation activities from the Process Areas. The U.S. Environmental Protection Agency (EPA, 2000), as part of site characterization activities in October 2000, collected a shallow groundwater sample from a "flooded, underground room". The sample location referenced in the EPA document may have been associated with the Megapond, located in the Process Areas and described in Section 2.0.

1.4 Data Quality Objectives

The Data Quality Objectives (DQOs) for field sampling and analytical activities described in this Work Plan include the collection of appropriate data to support the:

- Assessment of current ecological and human health risk associated with surface materials and process solutions, and the potential for these materials and solutions to be conveyed to possible down-wind and down-gradient receptors, respectively; and
- Development and evaluation of closure alternatives for mine closure units within the process areas at the Yerington Mine site, including the demonstration of chemical stability.

In order to ensure that data of sufficient quality and quantity are collected to meet the project objectives, the four-step DQO process listed below was utilized to develop the activities described in this Work Plan:

- Step 1. State the Problem;
- Step 2. Identify the Decision;
- Step 3. Identify the Inputs to the Decision; and
- Step 4. Define the Boundaries of the Study.

The problem statement (Step 1) is as follows: "Process Areas may represent a risk to human health and the environment and may have historically been, or currently represent, a source of constituents of concern to shallow groundwater". These Process Areas contained solutions and petroleum products, which could have potentially contaminated soils with the potential to impact groundwater. Also, it is unknown whether the Process Areas currently represent a source of fugitive dust that could be suspended and transported to down-wind receptors. Figure 3 presents a flow diagram that generally describes this potential source and potential migration pathways and receptors.

Step 2 of the DQO process (Identify the Decision) asks the key question that this Work Plan is attempting to address: "What monitoring, sampling and analytical activities for the Process Areas will serve to meet the started objectives of evaluating current ecological and human health risk and development of closure alternatives. The field monitoring and sample collection and analysis activities proposed in this Work Plan will be compared to existing information and integrated with results from site investigations for other surface mine units. The results of field investigations will be presented in a Data Summary Report, and may provide the basis for additional focused investigations to answer this question. The criteria necessary to determine if the proposed Work Plan activities will answer this question include:

- Will the collected data adequately document the quality, quantity, and potential migration pathways of solid and liquid materials associated with the Process Areas?
- Will the collected data provide an appropriate baseline to assess the effects of closure of the Process Areas?

Step 3 of the DQO process (Identify the Inputs to the Decision) identifies the kind of information that is needed to address the question posed under Step 2. Relevant historical and anecdotal information includes knowledge of process facilities construction, operations and maintenance, previous field monitoring and analytical results, and down-gradient receptors. The information to be obtained from the proposed field monitoring and sample collection and analytical activities (described in Section 3.0) will provide an adequate basis to address the other criteria of the DQO Process.

Step 4 of the DQO process (Define the Boundaries of the Study) defines the spatial and temporal aspects of the field monitoring, sampling and analytical activities proposed in this Work Plan. The field and analytical activities described in this Work Plan are anticipated to be conducted in 2002 or early 2003 within the boundaries of the Process Areas shown in Figure 2, and in greater detail in Figures 4 and 5.

SECTION 2.0

DESCRIPTION OF PROCESS AREAS

2.1 Overall Status and Land Use

All mining and ore beneficiation operations at the mine site have ceased and, with the exception of fluid management associated with Arimetco heap leach process components (described in a companion Work Plan), the Process Areas shown in Figure 2 are no longer active. Electrical, gas, and water services to all buildings within the Process Areas have been disconnected, except for the Administration Building and the Equipment Garage. All heavy mining equipment and haul trucks have been removed from the mine site. The land status of the approximate 230-acre area is also shown in Figure 2. Table 1 provides a summary of the buildings and an inventory of components within the Process Areas, which are shown in detail in Figures 4 and 5.

2.2 Process Component Descriptions and Status

Leach Vats

Eight leaching vats, each 10 feet apart, are shown in Figure 4. Each vat measures120 feet by 135 feet by 20 feet deep, with 18-inch concrete walls and concrete floors. The vats were used to percolate acid leach solution through the crushed ore and, subsequently, the application of rinse solution.

Buildings

There are 22 buildings located in the Process Areas, as shown in Figure 4. The buildings were used for various purposes relating to ore processing, equipment maintenance, administration and related operational activities. All of the buildings, unless noted otherwise on Figure 4 or in Table 1, are built on concrete slabs and are constructed of sheet metal. Typical construction includes concrete pavement of some sort in front of doorways or overhead doors, and some of the buildings contain attached concrete structures such as loading docks or secondary containment structures for storage tanks.

Precipitation Plant

The Precipitation Plant consisted of fifteen parallel concrete launders filled with light gauge scrap iron that were used to precipitate copper from the leach solution. Each launder measures 10 feet by 58 feet by five feet deep. The entire plant is approximately 600 feet long. The launders still contain some scrap iron.

Sulfide Plant

All buildings in the Sulfide Plant area have been removed, and only concrete structures remain. These concrete structures cover an area of approximately seven acres (800 feet by 400 feet), and consist of foundations, slabs, columns, trenches, ramps, and thickeners. All of the thickeners have been filled with alluvial material.

Primary and Secondary Crushers

The Primary Crusher was used to crush the ore to a five-inch product before being sent on to the Secondary Crusher, which reduced it to 0.5-inch diameter. All that remains of the Primary Crusher is the concrete foundation and walls, and the Secondary Crusher has been completely removed.

Petroleum Storage Tanks

There are currently six above-ground petroleum storage tanks located at the mine site: three tanks are located at the northwest end of the Truck Shop; two are located north of Change House; and the sixth, a used-oil tank, is located north of the Truck Shop. Table 2 summarizes the inventory of above-ground tanks including type, contents and secondary containment.

Petroleum Fuel Filling Stations

There are two fuel filling stations located northeast of the Administration building. Each of the stations has pipes protruding from the ground and fuel pumps located in the station sheds, an indication of the presence of underground petroleum storage tanks. The actual presence and capacity of underground tanks has not been verified.

Acid Tanks

The inventory of acid tanks is summarized in Table 2. There are currently four above-ground acid tanks located approximately 1,400 feet southwest of the Phase Four VLT Heap Leach (Figure 5). A 50,000-gallon metal sulfuric acid tank is situated within an earth-bermed, plastic-lined secondary containment area. Approximately 30 feet outside of the 50,000-gallon tank secondary containment, an approximate 10,000-gallon acid tank is laying on its side on the ground with chocks to prevent rolling.

Two other metal sulfuric acid tanks of approximately 5,000-gallon capacity are located approximately 70 feet northwest of the 50,000-gallon tank. These two tanks are situated in an earth-bermed, plastic-lined secondary containment. Soil within the secondary containment and at the end of an outlet pipe outside the secondary containment is yellow-colored, indicating leakage from these tanks. The contents of all the acid tanks have been drained, but the tanks have not been cleaned out. The volume of residual acid in the tanks is unknown.

Water Tank

There is a single water tank located northwest of Yerington Pit and approximately 1,500 feet southwest of the Leach Vats. The tank was used to supply water for Weed Heights, and is currently out of operation. The capacity and volume of water remaining in the tank is unknown.

Storage Areas for Chemicals, Used Oil, Transformers

The Solution Tanks (DD on Figure 4) consist of concrete floors and concrete walls approximately 18 feet tall. The southernmost Solution Tank is currently being used to store chemicals or petroleum products in approximately 280 55-gallon drums and soils in nine plastic 250-gallon containers. Several of the drums are damaged and/or leaking contents. Some of the drums are labeled as containing PCBs.

The Truck Shop contains 129 55-gallon drums, most of which are empty, and 41 of which are full or partially full drums of used oil and zeolites. The Truck Shop also contains approximately 30 five-gallon buckets containing various oils and oil-soaked trash. Some of the drums are damaged and leaking, some contain dried residue with flammable labels or PCB labels, and at least one drum is unlabeled.

Other areas of 55-gallon drum storage include the Equipment Garage, Fire Engine Storage, the Precipitation Plant, and 23 drums of tar (some leaking) stored northeast of the Equipment Garage. Chemicals remaining in the Assay Laboratory consist of a two-liter bottle of ammonium hydroxide, some ammonium hydrogen fluoride, and approximately 20 gallons of sulfuric acid.

Six large used transformers are currently being stored in the Emergency Shed, and some of these transformers are labeled as containing PCBs. There are 91 used transformers and oil-filled switches being stored in the Small Warehouse, and most of the transformers have been tagged as containing PCBs. There are also 67 transformers still in use at the mine site, mounted on poles or on concrete pads within fenced-in areas.

Foundations, Slabs, and Other Concrete Structures

Each of the 22 buildings listed in Table 1 are built on concrete slabs, except for the Assay Lab, which has a partial basement at its south end. An open basement foundation also exists southwest of the Anaconda Solution Tanks. There are also numerous concrete slabs throughout the Process Areas, at buildings, parking areas, and electrical sub-stations. The Sulfide Plant consists of approximately seven acres of various concrete structures.

Wells

There are two wells located in the Process Areas under this Work Plan. Well WW-10 is located along the northwest edge of the Sulfide Plant, and an unnamed well is located approximately 550 feet northeast of the north end of the Precipitation Plant.

SECTION 3.0

WORK PLAN

Atlantic Richfield proposes to conduct field investigations at the Process Areas shown in Figures 4 and 5. These activities include field screening and possible sample collection and analyses at 50 locations throughout the Process Areas. The areas of investigation covered under this Work Plan include, but are not limited to:

- Buildings used for maintenance shops, offices, storage, laboratory work, skilled crafts shops, and other ancillary uses.
- Surface and subsurface concrete structures, including foundations, slabs, and holding vessels.
- Soils in areas that represent general conditions within the Process Areas, including areas where solutions may have escaped containment.

Locations for field screening of soils (likely alluvium in the Process Areas) shall be selected based on the following criteria:

- Representative of general Process Area soil conditions;
- Close proximity to areas where recorded, alleged or apparent spills or releases occurred; and
- Close proximity to areas where past activities were conducted that represent a potential source for impact to soil or ground water.

The 50 proposed screening (and potential sampling) locations are presented in Figures 4 and 5, and described in Table 3. The final number and precise location of each screening event will be defined on the basis of observed site conditions at the time of the field investigations. Each location for field screening and soil sample collection will be presented in the Data Summary Report.

3.1 Field Investigations

Field activities will consist of the following:

- Final selection of field screening locations based on field observations and a review of historical records;
- Field screening of soils for sample collection;
- Collection and transmittal of selected soil samples for laboratory analyses;
- Determination if additional samples are required at depth;
- Documentation of sample location selection process and field sampling activities;
- Photographs of structures, excavations and soil sample areas;
- Estimates of building and structure dimensions; and
- Inventory of building and structure materials, and contents.

All physical measurements will be recorded to the accuracy allowed by the measurement method. Field screening instruments (pH meter and Photo Ionization Detection or PID) will be calibrated according to manufacturer's instructions. Instrument accuracy limits and calibration techniques will be described in the Data Summary Report. Documented field investigations, descriptions of buildings and structures, and laboratory analytical results will also be presented in the Data Summary Report.

<u>Field Screening</u>

The proposed field screening and potential sampling locations of representative soils in the Process Areas are shown in Figures 4 and 5, and listed in Table 3. Field screening will be conducted using calibrated pH meter and PID instruments to collect field data on soils collected with a hand auger or shovel at depths up to 12 inches below ground surface. The screening event will identify exposed and sub-surface soils with concentrations of organic vapors (i.e., potential petroleum impact) that exceed 20 parts per million by volume (ppm-v) and/or with paste pH values less than 5.5. If, at any location, organic vapor is detected above 20 ppm-v and/or paste pH values are less than 5.5 standard units, a composite soil sample will be collected for laboratory analyses at that location from the 6- to 12-inch interval below ground surface (bgs).

Up to half of the proposed field screening locations that pass the field screening pH criteria (i.e., paste pH values greater than 5.5 s.u.) will be selected for ABA and whole-rock analyses to ensure a representative characterization of soils for an assessment of human health and ecological risk.

Based on the field screening, composite samples collected for laboratory analysis for soils potentially impacted by acidic solutions or petroleum hydrocarbons would be subjected to the following procedures:

- Total petroleum hydrocarbons (extractable TPH-E) for locations with organic vapor concentrations that exceed 20 ppm-v.
- Laboratory pH and acid-base accounting (ABA) for locations with paste pH values less than 5.5.
- Whole-rock geochemistry for selected locations with paste pH values less than 5.5.

Field screening results would be used to determine whether any additional excavation and sampling activities were necessary to delineate the vertical or lateral extent of soils potentially contaminated by petroleum products at a particular location. If soil paste pH values are measured at less than 5.5 and/or organic vapors are detected to be greater than 20 ppm-v at three feet bgs, an additional composite sample would be collected and stored. This procedure would continue at depths of six feet, ten feet, and every five-foot depth after ten feet bgs until field screening criteria are met (i.e., pH greater than 5.5 and organic vapors less than 20 ppm-v). A confirmatory composite soil sample would then be collected at the appropriate depth from the soil (alluvial) depth determined to be unaffected by acidic solutions or hydrocarbons. The initial and confirmatory soil samples would then be submitted for one or more of the laboratory analyses listed above.

Agricultural parameter testing will be conducted for representative composite soil samples throughout the Process Areas.

3.2 Quality Assurance and Quality Control

Procedures for sample collection and analysis will follow the specifications and procedures described in Section 3.2, including quality assurance/quality control (QA/QC) methods. These trocedures will ensure that the type, quantity, and quality of data collected are consistent with the DQOs listed in Section 1.4. QA/QC issues for this Work Plan include:

- Appropriate detection limit and laboratory analytical level requirements;
- Appropriate levels of precision, accuracy, and comparability for the data;
- Appropriate quality control protocols (e.g., sample collection, handling, transport, instrument calibration); and
- Appropriate quality assurance protocols (e.g., duplicate samples).

<u>Sample Collection and Handling</u>

For pH field screening, a solution will be created in the field with soils and de-ionized water, and pH readings will be performed with a calibrated field pH meter. Five grams of soil will be collected from a field screening location and weighed into a four-ounce glass jar, on an electronic digital scale, to the nearest 0.1-gram. A five-milliliter aliquot of de-ionized water will be measured in a graduated cylinder, and added to the five grams of soil. The jar will be sealed with a teflon-lined lid, and shaken vigorously. After 30 minutes of allowing the jar to sit undisturbed, the jar will be shaken again. The lid will be removed and the pH instrument probe inserted into the soil/water solution. After the pH instrument readout stabilizes, the pH measurement will be recorded in a field notebook. At one of ten sample locations, the prepared soil/water solution will be checked with pH litmus paper (0 to 14 pH units) to provide reasonable quality assurance of the instrument readouts.

For organic vapor measurements, portions of each field screening sample will be placed in a sealed plastic bag and allowed to sit in direct sunlight to generate vapor. Organic vapor readings will then be performed with a portable organic vapor monitor (OVM) equipped with a PID by inserting the OVM inlet into the plastic bag and recording the maximum vapor reading in parts per million by volume (ppm-v).

Soil samples will be collected from each excavation by sampling from the backhoe bucket, or from the hand auger or shovel. Sample collection depth will be limited by excavation equipment capabilities, or until ground water is encountered. The composite samples will be placed in containers appropriate for each analysis. All soil samples to be analyzed for TPH will be immediately labeled and placed into iced coolers for transport under chain-of-custody to a Nevada-certified analytical laboratory. Soil data, sample collection intervals, and field screening measurements will be recorded on the appropriate excavation log during the investigation. Soil data will include soil color, moisture content, consistency, and a visual estimate of Unified Soil Classification.

If groundwater is encountered during backhoe excavations, the excavation will immediately end. No groundwater samples from the excavation would be collected because of the potential for groundwater to become contaminated from the excavation activities. Digging through the subsurface exposes ground water to soil that is being pushed or has fallen down from above the water table, compromising the actual water quality. If required, the need for groundwater monitoring in the Process Areas will be evaluated in the Groundwater Conditions Work Plan.

<u>Decontamination</u>

All soil collection (sampling) equipment shall be decontaminated between each excavation. Disposable scoops or plastic trowels will be used, or sampling equipment shall be decontaminated between each sampling location. Sampling equipment will be hand-washed with a solution of tap water and Alconox detergent, then double-rinsed. The decontamination wash would be accomplished with clean buckets, filled half to three-quarters full as follows:

- Bucket 1: Tap water with non-phosphate detergent such as Alconox
- Bucket 2: Clean tap water or de-ionized water.
- Bucket 3: Clean tap water or de-ionized water.

Equipment decontamination consists of the following general steps:

- Removal of gross (visible) contamination by brushing or scraping.
- Removal of residual contamination by scrub-washing in Bucket #1, rinsing in Bucket #2, then rinsing in Bucket #3. Change the water periodically to minimize the amount of residue carried over into the third rinse.

All washing and rinsing solutions are considered investigation derived waste and will be placed in containers. After use, gloves and other disposable PPE should also be containerized and handled as investigation derived waste.

Sample Identification and Preservation

Sample labels shall be completed with a permanent waterproof marker and attached to each laboratory sample container before each sample is collected, and shall include the following information:

- Sample identification
- Sample date
- Sample time
- Sample preparation and preservative
- Analyses to be performed
- Sample substance type
- Person who collected sample

Each sample will be tracked according to a unique sample field identification number assigned when the sample will be collected. This field identification number will consist of three parts:

- Sampling event sequence number
- Sampling location
- Collection sequence number

For example, the sample collected during the third sampling event at the fourth location sampled will be labeled: 003WD004. Blanks and duplicate samples shall be labeled in the same fashion, with no indication of their contents. For example, the duplicate sample to the one stated above might be labeled: 003WD006.

Sample Handling and Transport

The QA objectives for the sample-handling portion of the field activities are to verify that decontamination, packaging, and shipping are not introducing variables into the sampling chain that could render the validity of the samples questionable. In order to fulfill these QA objectives, duplicate QC samples will be used as described below. If the analysis of any QC samples indicates that variables are being introduced into the sampling chain, then the samples shipped with the questionable QC sample will be evaluated for the possibility of contamination.

Duplicate samples will be collected at a frequency of one in ten samples for each matrix and analysis. Duplicate samples will be collected by filling the sample containers for each analysis at the same time the original soil sample is collected. Each sample from a duplicate set will have a unique sample number labeled in accordance with the identification protocol, and the duplicates will be sent “blind” to the lab. For quality assurance purpose, no special labeling indication of the duplicate shall be provided.

Each collected sample container shall be labeled, sealed with a custody seal, sealed in a zip-loc© bag, logged on a chain-of-custody form, and placed in a cooler with ice. Contained ice shall be double bagged in zip-loc plastic bags. Seal the ice chest shut with strapping tape and place two custody seals on the front of the cooler so that the custody seals extend from the lid to the main body of the ice chest. If ice chest is being sent by mail: (a) enclose the chain of custody form and other sample paperwork in the ice chest by placing it in a plastic bag and taping the bag to the inside of the ice chest lid; (b) Label ice chest with “Fragile” and “This End Up” labels. Transport ice chests to the appropriate laboratory by hand-delivery as soon as possible or via express overnight delivery. Coordinate deliveries with the laboratory, ensuring that holding times are not violated.

Each chain-of-custody shall contain the following information:

- Project name
- Sampler's name and signature
- Sample identification
- Date and time of sample collection
- Sample matrix
- Number and volume of sample containers
- Analyses requested
- Method of shipment

For soil or sediment samples collected for ABA or whole-rock analysis, each sample will be collected in zip-loc bags or a five-gallon bucket (see Section 3.5) that will be sealed and labeled with similar QA/QC procedures described for other soil sample labeling and packaging prior to shipment to the analytical laboratory.

3.3 Laboratory Analyses

Solid media samples shall be analyzed in accordance with the following protocols, which is summarized in Table 3.

Soil Analyses

Collected soil samples will be analyzed by a Nevada-licensed laboratory. Soil analyses and proposed detection limits are listed in Table 4. Composite soil samples collected as a result of the field screening process would be submitted for some combination of TPH-E, pH, ABA and whole-rock geochemical analyses depending on the nature of the impacted area. Additionally, composite samples that represent general Process Area near-surface soil conditions would be analyzed for the following agricultural parameters:

- Nitrogen, Phosphorus, and Potassium (NPK)

- Boron and Chlorine
- Calcium, Magnesium and Sodium
- Sodium Absorption Ratio (SAR)

The following soil sample minimum quantities are required:

- For TPH analysis, approximately 0.65 kg, or 8-ounce by volume sample in a clean glass sample jar.
- For ABA, whole-rock and agricultural analyses, two 1 kg samples in clean zip-loc© bags.

3.4 Documentation

Summary of field measurement and sampling activities will be recorded in a bound site logbook, and entries must contain accurate and inclusive documentation of project activities. Entries will be made using permanent waterproof ink, and erasures are not permitted. Errors shall be single-lined out, should not be obscured, and initialed and dated. The person making the entries will sign at the beginning and the end of the day's entries, and a new page will be started for each day.

The following entries will be made to the bound site logbook and/or filed log sheets:

- General descriptions of weather conditions
- Location of each sampling point
- Data and time of sample collection (field log sheets.)
- The type of blank collected and the method of collection
- Field measurements made, including the date and time of measurements
- Calibration of field instruments
- Reference to photographs taken
- Date and time of equipment decontamination
- Field observations and descriptions of problems encountered
- Duplicate sample location

Photographs will be taken at each field measurement/sampling point. The photo location and number will be recorded on the field log sheets. In addition to the logbook, an inventory of observed or reported chemicals would be conducted during the site investigation. The inventory would record the type of substance (phase and name, or unknown), type of container, and estimated quantity.

3.5 Site Job Safety Analysis

A site-specific Job Safety Analysis (JSA) will be prepared for the Process Areas investigative field work, in accordance with Atlantic Richfield Health and Safety protocol and the Brown and Caldwell Yerington Mine Site Health and Safety Plan (SHSP). The SHSP identifies, evaluates, and prescribes control measures for safety and health hazards, in addition to providing for emergency response at the Yerington Mine site. SHSP implementation and compliance will be the responsibility of Brown and Caldwell, with Atlantic Richfield taking an oversight and compliance assurance role. Any changes or updates will be the responsibility of Brian Bass with Brown and Caldwell, with review by Atlantic Richfield Safety Representative Lorri Birkenbuel. Three copies of this plan will be maintained. One copy will be located at the site, one copy will be located in Atlantic Richfield's Anaconda office, and one copy will be located in the Brown and Caldwell office.

The SHSP includes:

- Safety and health risk or hazard analysis;
- Employee training records;
- Personal protective equipment (PPE);
- Medical surveillance;
- Site control measures (including dust control);
- Decontamination procedures;
- Emergency response; and
- Spill containment program.

The SHSP includes a section for site characterization and analysis that will identify specific site hazards and aid in determining appropriate control procedures. Required information for site characterization and analysis includes:

- Description of the response activity or job tasks to be performed;
- Duration of the planned employee activity;
- Site accessibility by air and roads;
- Site-specific safety and health hazards;
- Hazardous substance dispersion pathways; and
- Emergency response capabilities.

All contractors will receive applicable training, as outlined in 29CFR 1910.120(e) and as stated in the SHSP. Copies of Training Certificates for all site personnel will be attached to the SHSP. Personnel will initially review the JSA forms at a pre-entry briefing. Site-specific training will be covered at the briefing, with an initial site tour and review of site conditions and hazards. Records of pre-entry briefings will be attached to the SHSP.

Elements to be covered in site-specific briefing include: persons responsible for site-safety, site-specific safety and health hazards, use of PPE, work practices, engineering controls, major tasks, decontamination procedures and emergency response. Other required training, depending on the particular activity, may include MSHA 40-hour training and annual 8-hour refresher courses. Other training may include, but is not limited to, competent personnel training for excavations and confined space, first aid, and cardio-pulmonary resuscitation (CPR). Copies of the 40-hour and annual refresher certificates for site personnel will be attached to the SHSP.

The individual JSA for the Process Areas work incorporates individual tasks, potential hazards or concerns associated with each task, and the proper clothing, equipment, and work approach for each task. The following table summarizes the Process Areas JSA, provided in Appendix A:

SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS
1. Pre-Construction Safety Meeting.	
2. Sample location setup backhoe	1. Drilling or digging into underground utilities 2. Striking overhead lines or objects with drill mast or backhoe boom.
3. Soil sampling: Backhoe excavation	1. Injury to hearing from noise. 2. Inhalation hazards from dust from drilling or excavation activities. 3. Physical injury from moving parts of machinery. 4. Physical hazards to personnel on the ground in the vicinity of the heavy machinery. 5. Hazard from being in or near excavation.
4. Prepare sample containers and dress in appropriate PPE.	1. Burn or corrosion from acid spillage, if sample bottles require addition of acid or have acid already in them.
5. Collection of soil sample by hand and decontamination of equipment.	1. Skin irritation from dermal or eye contact. 2. Slipping or falling on concrete structures- sharp rock and protruding objects. 3. ENCOUNTERING CONTAINERS WITH SEALED AND UNLABELED CONTENTS ---UNKNOWN !!!! POTENTIAL FOR EXPLOSION OR INHALATION OF POISONOUS VAPOR OR DUST.
6. All Activities	Slips, Trips, and Falls
7. All Activities	Back, hand, or foot injuries during manual handling of materials.
8. All Activities	• Heat exhaustion or stroke.
9.All Activities	• Hypothermia or frostbite
10.Unsafe conditions.	• All potential hazards.

SECTION 4.0

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